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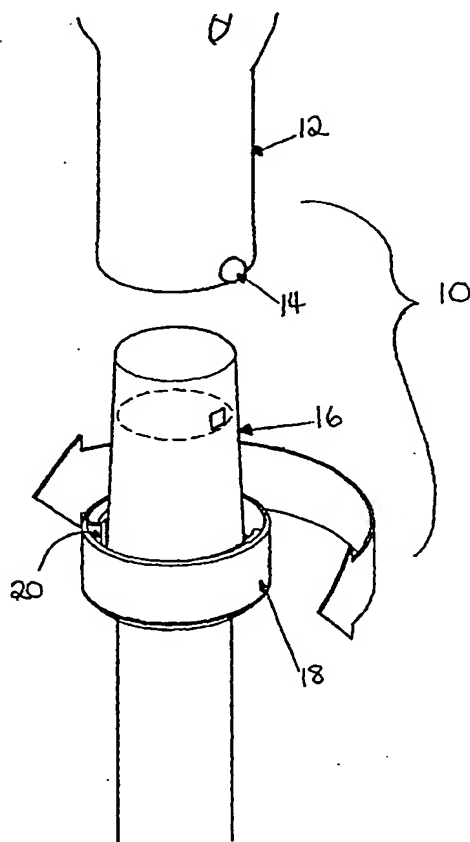
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(54) Title: **CONNECTOR FOR UMBRELLA SHAFTS**



(57) Abstract: There is provided a generally cylindrical connector (10), for connecting two parts of an umbrella shaft together, for example. The connector is made of a first portion (12) having a pip or bump (14) near its axial end, a second portion (16), and a ring (18), the ring being mounted on the second portion so that the ring can rotate about the axis of the connector. The first and second portions of the connector are connected to, or form, the ends of upper and lower poles of an umbrella frame. The upper portion (12) can also function as an inner casing for a crank used for unfurling the umbrella, into which the upper pole part is inserted.

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## CONNECTOR FOR UMBRELLA SHAFTS

The present invention relates to a connector for connecting two elongate poles together, such as the upper and lower portions of an umbrella shaft.

Such a connector is needed for larger umbrellas such as garden umbrellas or parasols, where the shaft is in two parts for convenience of storage.

Existing connectors of this type use a split ring on the lower shaft part, surrounding the upper shaft part. The ring has two lugs, one at each side of the split, which can be urged together by a cam surface as a lever so as to clamp the upper shaft. However, this connection does not lock positively.

An alternative connector of this type uses a spring loaded pin mechanism. The two portions of the shaft have slightly different diameters, and when they are pushed together a spring loaded pin on the smaller diameter portion pushes through a hole in the larger diameter portion. This produces a more positive lock than the split ring connector but there is an undesirable amount of free play in the connection.

The present invention aims to overcome these problems with the prior art.

According to the present invention there is provided a connector for connecting two elongate poles together, comprising: a first portion and second portion each having a substantially conical surface, one external and one internal respectively so that one portion can be inserted inside the other; and a latch means for holding the two portions together. Preferably the latch means is a ring rotatably mounted on one of the portions, the other portion being releasably held by the ring by means of at least one pip that engages with an overhanging part of the ring as the ring is rotated.

To prevent accidental release the track can have a transverse (i.e. axial) lip or rib over which the pip

can be urged by applying an external force, so that once the pip has passed over the lip it is held under the overhanging part and cannot exit the track without an external force being applied. The external force is applied simply by twisting the ring. Preferably a cam track is included so that when the connected parts are to be separated the pip and the ring are pushed apart at the cam track.

The second portion may be fitted to the upper end of a lower shaft part and have a conical outside surface; the first portion may be applied to the lower end of an upper shaft part and have a conical inside surface or vice versa. The conical surfaces are generally of larger axial extent than radial. The ring can be mounted at the base of the external cone. The pitch of the conical surfaces of the first and second portions of the connector should be the same for a tight fit.

The pip or protuberance is preferably located on the portion with the inner conical surface, preferably on the outside surface of this connector portion; the bayonet fitting may be disposed on the inside surface of the ring correspondingly.

To secure the ring rotatably on its connector portion one of these parts may have a flange, while the other may have a lip over which the flange engages. Having an incomplete flange or lip enables the two parts to be snapped together.

For a better understanding of the invention, embodiments of it will now be described with reference to the following drawings, -in which:-

Fig. 1 shows a cylindrical connector;

Fig. 2 shows a first portion of the cylindrical connector;

Fig. 3a shows the ring in cross section;

Fig. 3b shows the ring in cross section taken at right angles to the cross section of Fig 3a;

Fig. 4 shows an exploded view of the connector.

Turning to Fig. 1, this shows generally at 10 a generally cylindrical connector. The connector is made of a first portion 12 having a pip or bump 14 near its axial end, a second portion 16, and a ring 18, the ring being mounted on the second portion so that the ring can rotate about the axis of the connector. The first and second portions of the connector are connected to, or form, the ends of upper and lower poles of an umbrella frame. They are preferably partially hollow to facilitate this connection and to afford greater resistance to bending. The upper portion 12 is in fact an inner casing for a crank used for unfurling the umbrella, into which the upper pole part is inserted.

Fig. 2 shows the lower end of the first portion 12 of the connector. The outer surface 22 of the first portion is cylindrical, whereas the inner surface 24 is smooth and (frusto-)conical, as shown by the dotted lines. Fig. 2 also shows the connector portion with two diametrically opposite pips.

Figs. 3a and 3b show the ring 18 in cross section and in elevation. The inner surface is profiled to form a track 20, an overhanging ridge forming a bayonet hook 32 near the upper edge, a wall acting as a release cam 26, a retaining rib 28 defining a rest area 30 and a bearing lip 34. The track 20 has an axial entry point and then turns to run generally circumferentially under the hook 32. All these features are duplicated a half-turn around the ring, as the dashed lines in the views show.

Fig. 4 shows an exploded view of the connector 10. In the assembled lower half of the connector the two lips on the lower edge of the ring 18 engage in a groove formed by an adjacent pair of flanges 36 on the lower connector portion 16, so that the ring is held captive on the connector portion, but rotatable about its axis. The upper connector half has the tubular

portion 12 surrounded by a crank handle assembly 38 whose shaft passes through holes in the connector portion 12. The crank is used for furling and unfurling the umbrella by way of a cord or cable passing up the shaft. The upper shaft 40 is riveted near the top of the connector portion.

The second portion of the connector 16 also has a smooth conical (outer) surface, having a pitch identical to that of the inner conical surface 24 of the connector portion 12. This allows part of the second portion to sit inside the first portion.

To connect the poles together in line the first connecting portion 12 is introduced into the ring and the pips 14 enter the track 20. The pips are guided by the walls 26 and the ring is then turned anticlockwise (as seen from above) so that the bayonet hook 32 travels over the pips, during which motion the latter are urged over the rib 28. The pip then becomes trapped in the rest area 30, since the upper wall or overhang formed by the bayonet hook 32 turns down to the lower edge of the ring. The pip cannot easily return over the rib 28 without having an external force deliberately applied, so that accidental release is prevented. The hook 32 has an initial portion which is bevelled, to assist the tight fitting together of the two cone parts. Fig. 3b shows a cross section of the ring 18, taken 90 degrees from the cross section of Fig. 3a.

When the two parts of the connector are to be disconnected, the pip 14 is urged past the lip 28, by applying some external force, for example by rotating the ring 18 clockwise; this causes the pip to ride up the wall 26 in the track 20. The shape of the wall 26 causes the pip to rise up the relatively shallow track and exit from the ring, thus disconnecting the first and second connector portions. The cam action is usually needed because the two halves are very difficult to separate by hand once they have been

forced together.

In this example the pole is the upper portion of an umbrella shaft, and the housing 38 has a handle attached to a mechanism such as a cord (not shown) whereby the umbrella can be unfurled and retracted, and possibly also the top portion of the umbrella can be tilted by turning the handle. The second portion of the connector 16 is attached to a second elongate pole 42. In this example this would form the bottom portion of the shaft of the umbrella. However, the invention could also be applied to any elongate or frame members, such as a tent frame, a walking stick or a construction set, for example.

As will be apparent, in the context of the invention the term cone or conical should be taken to mean substantially conical or substantially frusto-conical, and should also be considered to include cones having a non-circular cross section.

## CLAIMS

1. A connector for connecting two elongate elements together, comprising:

5 a first connector portion (12) and second connector portion (16) each having a substantially conical surface, one external and one internal respectively so that one portion can be inserted inside the other; and

10 a latch means (18) for holding the two connector portions together.

2. A connector as claimed in claim 1, wherein the latch means comprises a bayonet coupling having two  
15 parts, namely a pip (14) and a track (20) in which the pip engages.

3. A connector as claimed in claim 2, wherein the latch means includes a ring member (18) rotatably  
20 mounted on one of the connector portions, the ring comprising one part (14, 20) of the bayonet coupling, the other connector portion comprising the other part (20, 14) of the bayonet coupling.

25 4. A connector as claimed in claim 3, wherein the said other connector portion has the pip (14) and the ring is provided with the generally circumferential track (20) in which the pip moves, as the ring is rotated.

30 5. A connector as claimed in any of claims 2 to 4, wherein the track (20) has a transverse (i.e. axial) lip or rib (28) over which the pip can be urged by applying an external force, so that once the pip has  
35 passed over the lip it is held within the track and cannot exit the track without an external force being applied.

6. A connector as claimed in any of claims 3 to 5,  
wherein a cam track (26) is included in the track (20)  
so that when the assembled connector parts are to be  
separated the pip and the ring are pushed apart by the  
5 cam track.

7. A connector as claimed in any of claims 3 to 6,  
wherein one of the connector portions has a flange (36)  
to secure the ring rotatably thereon, while the ring  
10 has a lip (34) over which the flange engages.

8. A connector as claimed in any of claims 2 to 7,  
wherein the pip or protuberance (14) is located on the  
connector portion with the inner conical surface, and  
15 the track (20) is disposed on the connector portion  
with the outer conical surface.

9. A connector as claimed in any of claims 3 to 8,  
wherein the ring (18) is mounted at the base of the  
20 external cone.

10. An umbrella frame including two pole parts (40,  
42) connected with a connector according to any  
preceding claim.

25 11. An umbrella frame as claimed in claim 10, wherein  
the first connector portion (12) is fitted to the lower  
end of the upper pole part (40) and has a conical  
inside surface; and the second connector portion (16)  
30 is applied to the upper end of the lower pole part (42)  
and its conical surface is an outside surface.

12. An umbrella frame as claimed in claim 10 or 11,  
further including a crank mechanism (38) fitting over  
35 the first connector portion (12).

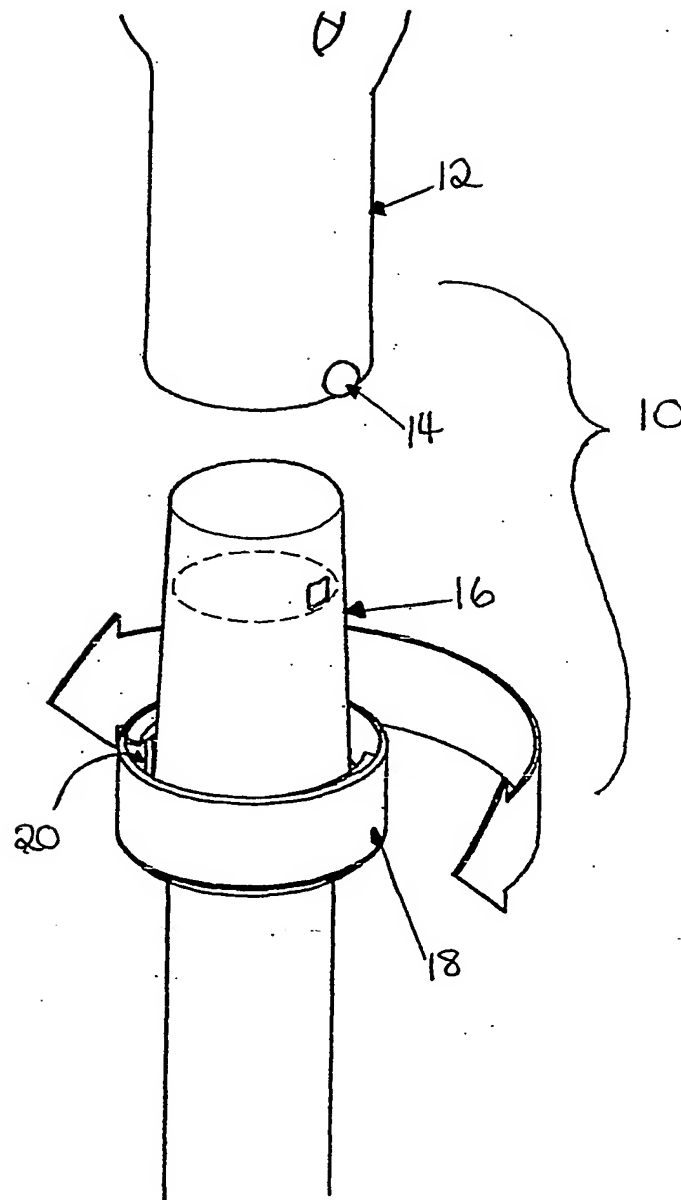


Fig. 1

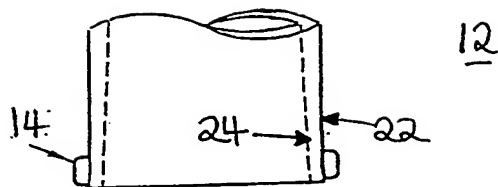


Fig. 2

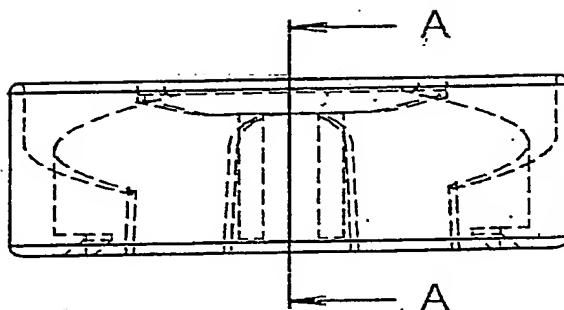
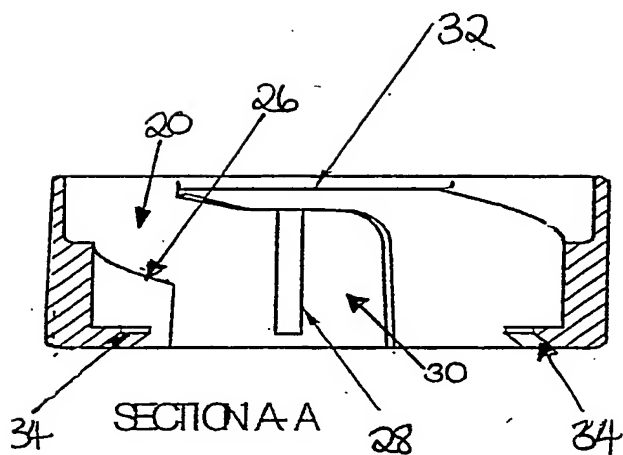


Fig. 3a

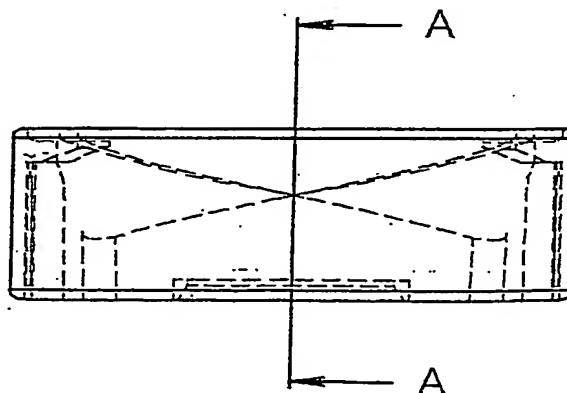
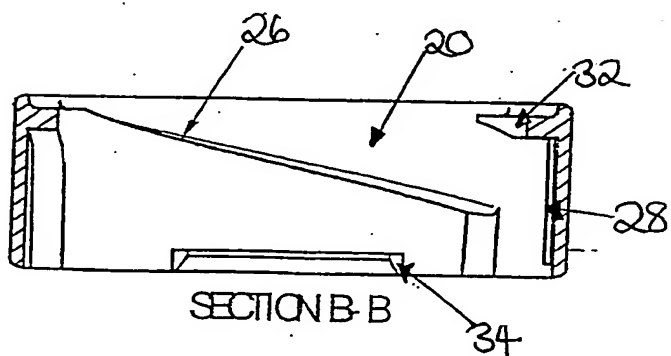


Fig. 3c

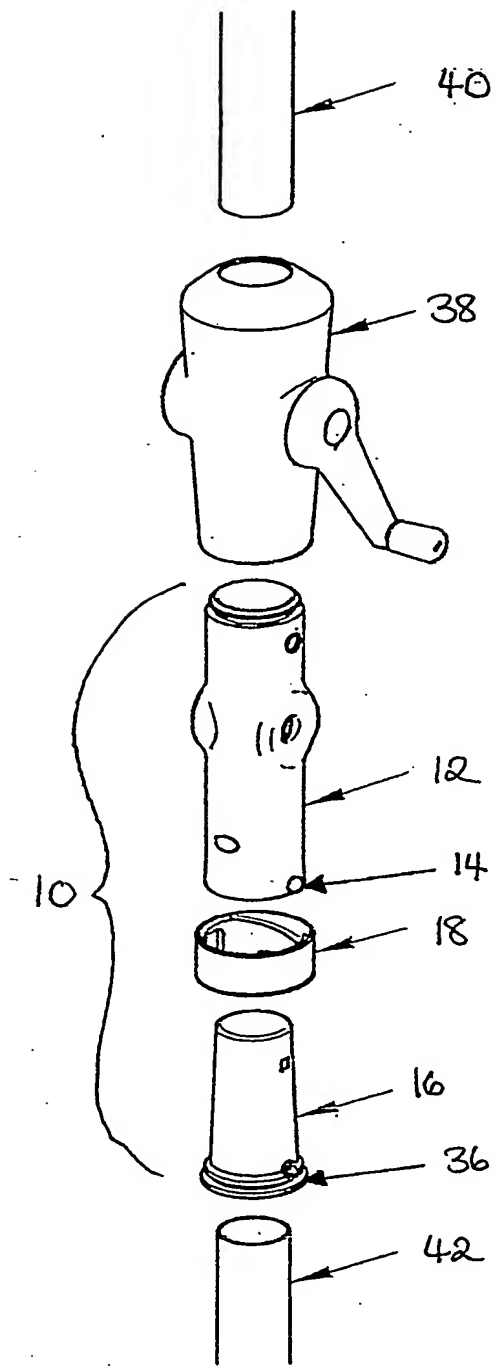


Fig. 4

## INTERNATIONAL SEARCH REPORT

In International Application No  
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IPC 7 F16B7/20 A45B19/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 F16B A45B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 736 011 A (WARD J E) 29 May 1973 (1973-05-29)	1-4
Y	column 2, line 23 -column 3, line 60; figures 1-3	10-12
A		5-9
Y	GB 2 102 056 A (ANDREWS JOHN ROGER) 26 January 1983 (1983-01-26) page 1, line 67 - line 96; figures 1-3	10-12
A	US 2 671 459 A (HENDERSON GLENN A) 9 March 1954 (1954-03-09) column 3, line 19 -column 5, line 31; figures 1-9	10-12

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Information on patent family members

In            onal Application No  
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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3736011	A	29-05-1973	NONE	
GB 2102056	A	26-01-1983	NONE	
US 2671459	A	09-03-1954	NONE	

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